



## Abraham Lincoln Birthplace National Historical Park Water Quality Summary Fiscal Year 2010

### Water quality at Abraham Lincoln Birthplace National Historical Park remains good.

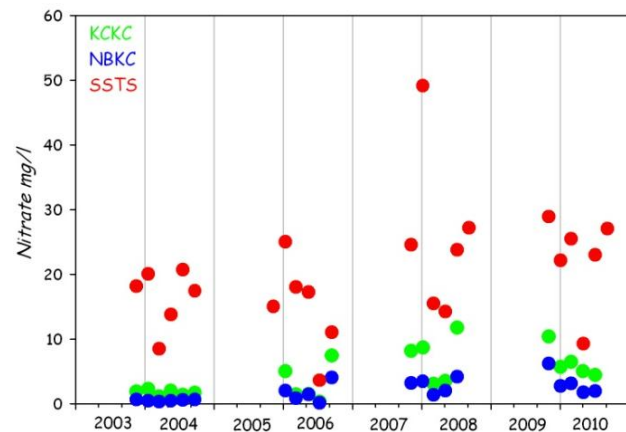


North Branch Knob Creek, November 18, 2003. Image by Joe Meiman.

The Cumberland Piedmont Network Inventory and Monitoring Program began long-term water quality monitoring at Abraham Lincoln Birthplace National Historical Park in fiscal year 2004. Water quality is measured every other month on alternate years at three sites; North Branch of Knob Creek and Knob Creek at the Boyhood Home Unit, and Sinking Spring at the Birthplace Unit. Based upon program requirements and findings of the water quality inventory, a set of parameters was chosen for long-term monitoring; including the field measures of water temperature, specific conductance (SpC), pH, and dissolved oxygen (DO). Samples were also analyzed for *Escherichia coli* (*E. coli*) and nitrate.

### Highlights of Fiscal Year 2010 Monitoring

The only violation of a state water quality standard was recorded at North Branch of Knob Creek in July 2010. Dissolved oxygen (DO) was 3.84 mg/l, just below the 4.0 mg/l minimum. However it was not a true violation as the creek had been reduced to a series of isolated pools in response to drought conditions.



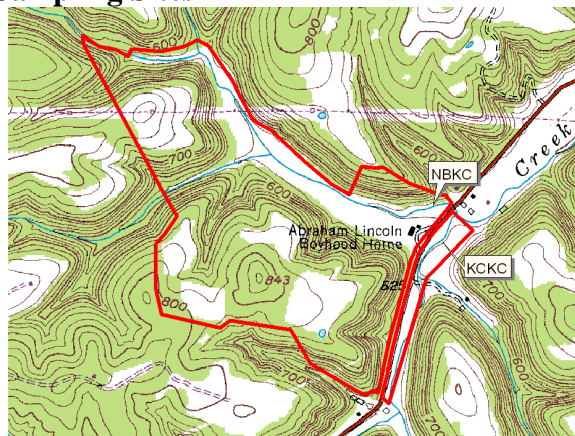
While well below the USEPA recommended limit of 90 mg/l for freshwater aquatic life, nitrate concentrations have been found to be elevated at Sinking Spring. For reference, the USEPA drinking water standard for nitrate is 45 mg/l, which was exceeded once in January 2008. Nitrate levels are found to be highest during low flow and are not always associated with elevated *E. coli*, suggesting the nitrate source is stored in the epikarst – the upper few meters of weathered limestone – providing the majority of recharge to Sinking Spring during low flow conditions.

### Water Quality Standards

The streams of the “Boyhood Home Unit” are designated “Warm Water Aquatic Habitat” (WW) while Sinking Spring is classified as “Cold Water Aquatic Habitat” (CW). By virtue of being within a national park unit, all are considered “Outstanding Resource Waters” which limit discharges of pollutants within the watersheds. The state currently does not impose a standard for *Escherichia coli* bacteria so based on the lack of recreation we have adapted the USEPA recommendations for “Single Sample Infrequently Used Full Contact Recreation” of 576 MPN/100ml. We also use the USEPA freshwater aquatic life recommendation for nitrate of 90 mg/l.

<b>Water Temperature</b>	Not to exceed 31.7°C
<b>Dissolved Oxygen</b>	Not to exceed 4.0 mg/l (WW) Not to exceed 5.0 mg/l (CW)
<b>pH</b>	Between 6.0 and 9.0 SU
<b><i>Escherichia coli</i></b>	Not to exceed 576 MPN/100ml
<b>SpC</b>	No Standard
<b>Nitrate</b>	Not to exceed 90 mg/l

### Sampling Sites



**NBKC** North Branch Knob Creek  
**KCKC** Knob Creek  
**SSTS** Sinking Spring  
Sinking Spring, located in the Birthplace Unit, is not depicted on the map.

### Future Monitoring

Water quality sampling is scheduled to resume in fiscal year 2012.

Water quality data are available upon request to the Cumberland Piedmont Network or our website:

<http://science.nature.nps.gov/im/units/cupn/reports.cfm>